Kalmar Industries Corporation

Mid-America Manufacturing Technology Center

Kalmar Industries Corporation Ensures Cab Quality

Client Profile:
Kalmar Industries Corporation is the global market-leading brand in container handling solutions in ports and terminals where containers are handled by ship-to-shore cranes, yard cranes, shuttle and straddle carriers, reachstackers and empty container handlers. Kalmar forklift trucks are used by heavy industry, their log stackers by the wood and paper industry, and their terminal tractors by distribution and logistics centers. The Ottawa, Kansas location assembles forklift trucks for distribution throughout North America. Founded in 1958, the company currently employs 15 people.

Situation:
Some of Kalmar's yard truck cabs were developing body cracks during normal use. The cracks began at the radius areas around the windshield and continued to the edges of the cab on both sides of the vehicle. The company tried to address the problem by polishing the radius cuts around the windshield area to reduce the stress concentrators associated with rough tooling marks. This did not fix the problem. Kalmar then contacted the Mid-America Manufacturing Technology Center (MAMTC) to conduct tests to determine what was causing the cracks so they could eliminate the problem and maintain their high quality.

Solution:
MAMTC conducted strain gauge testing on eight high-stress areas of each cab tested including the area that had been prone to cracking. After four days of testing, it was confirmed that the damage to the cab structure was caused by motion of the front section of the cab due to maneuvers made by the drivers during normal truck usage. Rough road conditions were identified as a contributing factor in that they intensified the damage to the cab. Kalmar then developed design changes for future cab production. The changes would increase stiffness that had been lost as a result of a dashboard redesign, and lighter materials were substituted for heavier ones. The remaining challenge was to fix the vehicles in use, many of which had already begun to develop cracks. MAMTC and Kalmar engineers began to identify modifications to protect vehicles in the field from cracking. New tests were developed to compare stress levels of modified cabs to the baseline of the original cab design. The fix for current cabs was a diagonal brace installed across the width of the cab. This created side to side stiffness and helped prohibit vibrations in the front axis of motion.

Results:
* Invested $130,000 in research and development.

Anticipated results:
* Retained sales of $7.5 million.
* Realized $200,000 in cost savings.

Testimonial:

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